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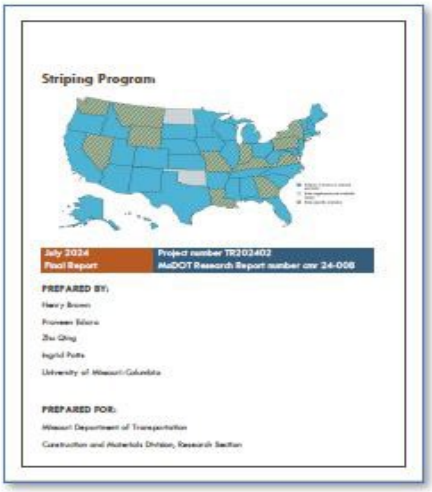
Research Summary

Striping Program



The use of wider (greater than 4 in.) edge line pavement markings is recognized as a proven safety countermeasure by the Federal Highway Administration (FHWA). However, providing wider edge lines can pose challenges due to budget and striping capacity constraints. One strategy that could be used to address the capacity constraints involves reducing the amount of striping performed on low volume roads.

The objective of this research study is to synthesize existing research and DOT practices regarding the use of wider edge line markings on all roads and the use or non-use of pavement markings on low volume roads to facilitate the evaluation of tradeoffs between different pavement marking strategies.

A review of previous research studies on the safety performance of wider pavement markings has shown safety benefits associated with the use of wider pavement markings when looking at more recent research (2011-2023). Research studies have shown crash reductions for wider pavement markings ranging from 7% to 30% (total crashes) and from 14% to 51% (fatal and injury crashes) and benefit-cost ratios ranging from 24:1 to 55:1.

Results from other studies on wider pavement markings have shown mixed results regarding the effects of marking width on lane position and encroachment and positive benefit of wider markings for machine vision. However, the literature review did not identify any research regarding considerations for pavement marking width based on striping capacity constraints.

Regarding prevalence of wider pavement markings, most state DOTs use 6-in. markings (or, in some cases, 5-in markings) to some extent (see Figure 1). The user of wider pavement markings by state DOTs is sometimes based on roadway type, Annual Average Daily Traffic (AADT), and other factors.

"The existing research provides more support for the use of wider pavement markings than for the use of pavement markings on low volume roads."

Previous research studies on the use of pavement markings on low volume or narrow roads have shown mixed results with respect to safety performance. The literature review identified 12 state DOTs with state-specific warrants for center line or edge line markings on low volume roads.

Interviews were conducted with seven DOTs regarding their practices for using wider pavement markings and pavement markings on low volume roads. Criteria for selection included diversity with respect to geography, pavement marking width, and use of state-specific pavement marking warrants as well as feedback

from the project Technical Advisory Committee (TAC).

Six of the seven DOTs that participated in the interviews use wider pavement markings to some extent. With respect to the timing of implementation, three of these seven DOTs have either switched to 6-in. markings or have expanded their use of 6-in. markings since 2020. Two are planning to switch to 6-in. markings in the future.

Challenges that these seven DOTS have faced in changing to wider markings include communication across departments, agency buy-in, budget considerations, striping capacity, and changes in striping equipment or purchasing additional striping equipment. Some have been able to manage the increased cost of wider striping through additional funding or other means. However, two DOTs indicated that they would have to reduce striping on low volume roads to accommodate an expansion of wider striping.

Overall, the existing research provides more support for the use of wider pavement markings than the use of pavement markings on low volume roads. Given these findings, MoDOT could further explore the use of 6-in. markings on minor routes and the elimination of pavement markings on some low volume roads.

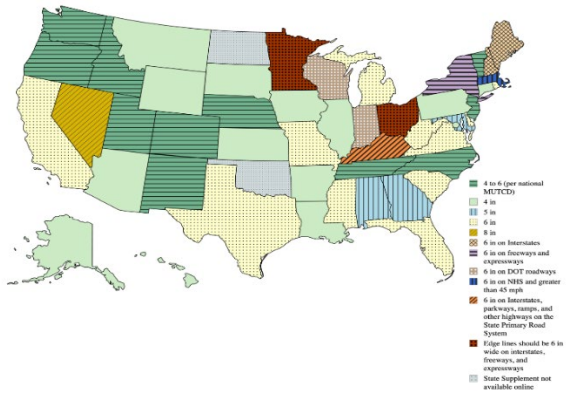


Figure 1: Map showing pavement marking width by state DOT for freeways (Map created with mapchart.net).

Project Information

PROJECT NAME: TR202402—Striping Program

PROJECT START/END DATE: August 2023-June 2024

PROJECT COST: $125,000

LEAD CONTRACTOR: University of Missouri-Columbia

PRINCIPAL INVESTIGATOR: Henry Brown

REPORT NAME: Striping Program

REPORT NUMBER: cmr 24-008

REPORT DATE: July 2024

Project Manager

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